

California Solar Policies and Programs

**Sean Gallagher, Energy Division
Intersolar Conference, San Francisco, July 16, 2008
“Status & Perspectives of US & European Policy Frameworks”
Panel Discussion**



California's Solar Installations



Photo: Travis Richardson, Hansen Trout Farm; Fillmore, CA.
105 kW California Solar Initiative Funded System, June 2007,
Installer: GW Richardson Heating & Air Conditioning, Inc.
Engineer/Designer: Kris Sutton, Travis Richardson

Installed

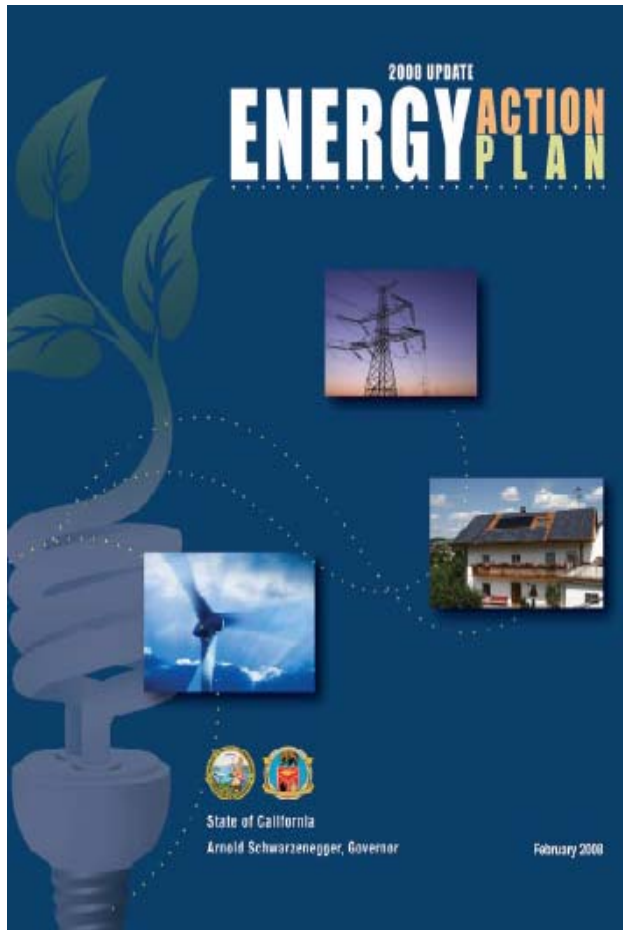
- 339 MW PV – customer sited
 - 356 MW CSP – utility scale
- = total 695 MW solar**

Projects in Pipeline

- 200+ MW PV – customer sited
 - 250 MW PV – utility owned DG (SCE)
 - 1,650 MW CSP & PV @ utility scale
- = total 2,100 MW *new* solar**

Sources: CEC Grid Tied PV Summary (April 1, 2008), CEC 2007 Power Plant Database, California Solar Initiative Staff Progress Report April 2008, CPUC 20% by 2010 Project Tracking Spreadsheet April 2008

Energy Action Plan's "Loading Order"



- Energy efficiency
- Demand response
- Distributed generation
- Renewable generation
- Cleanest available fossil resources

California's Solar Policies & Programs

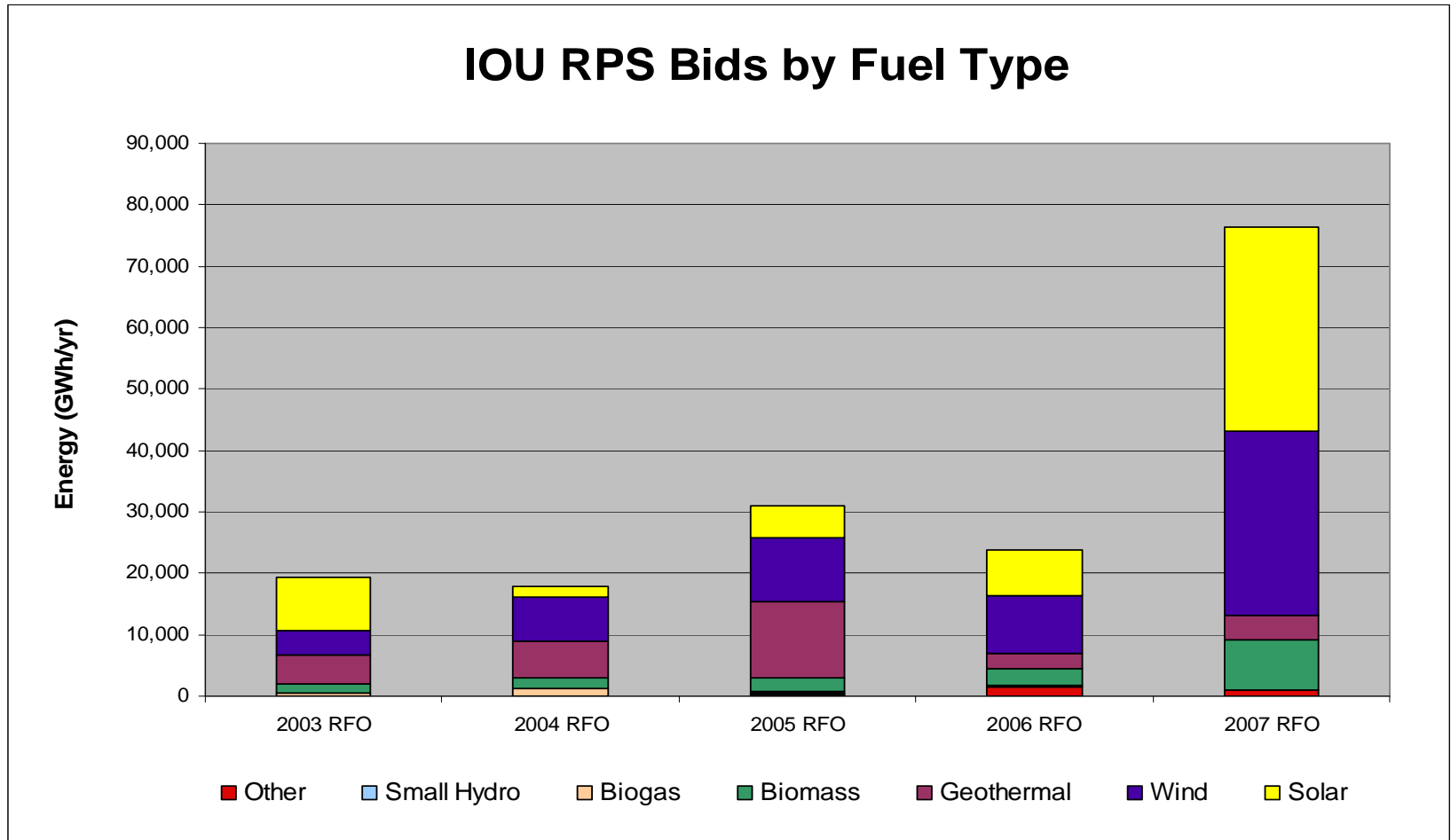
- Renewable Portfolio Standard (RPS)
- California Solar Initiative
- Additional Solar-Related Programs
 - Solar Hot Water Program
 - Feed-in-Tariffs for Small Renewable Energy Generators
 - Net energy metering (NEM) and Interconnection Rules
 - Utility-owned Distributed Generation (DG) Proposal

California's Renewables Portfolio Standard (RPS)

- All retail electricity sellers (utilities & ESPs) must procure renewables
 - 20% renewables by 2010 – by law
 - 33% renewables by 2020 – as a policy goal
- CPUC oversees IOU RPS procurement and compliance
- Builds upon California's strong history of renewables procurement
 - E.g. 356 MW of concentrated solar installed in early 1980s
- RPS is technology neutral
 - No specific solar goal
 - Many solar projects are in pipeline
 - And in 2007 – we saw large increase in solar projects bidding on RPS contracts

RPS resource mix shifting:

more bids and contracts from solar thermal and PV



Utility-scale solar faces challenges

- **Permitting**
 - Large footprint may make permitting difficult; environmentalists already raising concerns.
 - Use of water for wet-cooling in the desert also controversial.
- **Site control**
 - Bureau of Land Management inundated by lease applications for solar development; recently-launched Programmatic Environmental Impact Statement aims to refine, streamline review process.
- **Transmission**
 - Best areas for solar development often transmission-constrained;
 - Renewable Energy Transmission Initiative (RETI) brings agencies and stakeholders together to identify best areas for all types of renewable development and expedite permitting of transmission to access them

California Solar Initiative



Photo: Ericson Solar, Residence of Charles and Debbie Mckeown, Placerville, CA; California Solar Initiative Funded System installed Spring 2007, 9.7 kW, nstaller: Ericson Solar

Goals

- 3,000 MW of new customer-owned distributed solar
- Self-sustaining solar industry free from ratepayer funded incentives

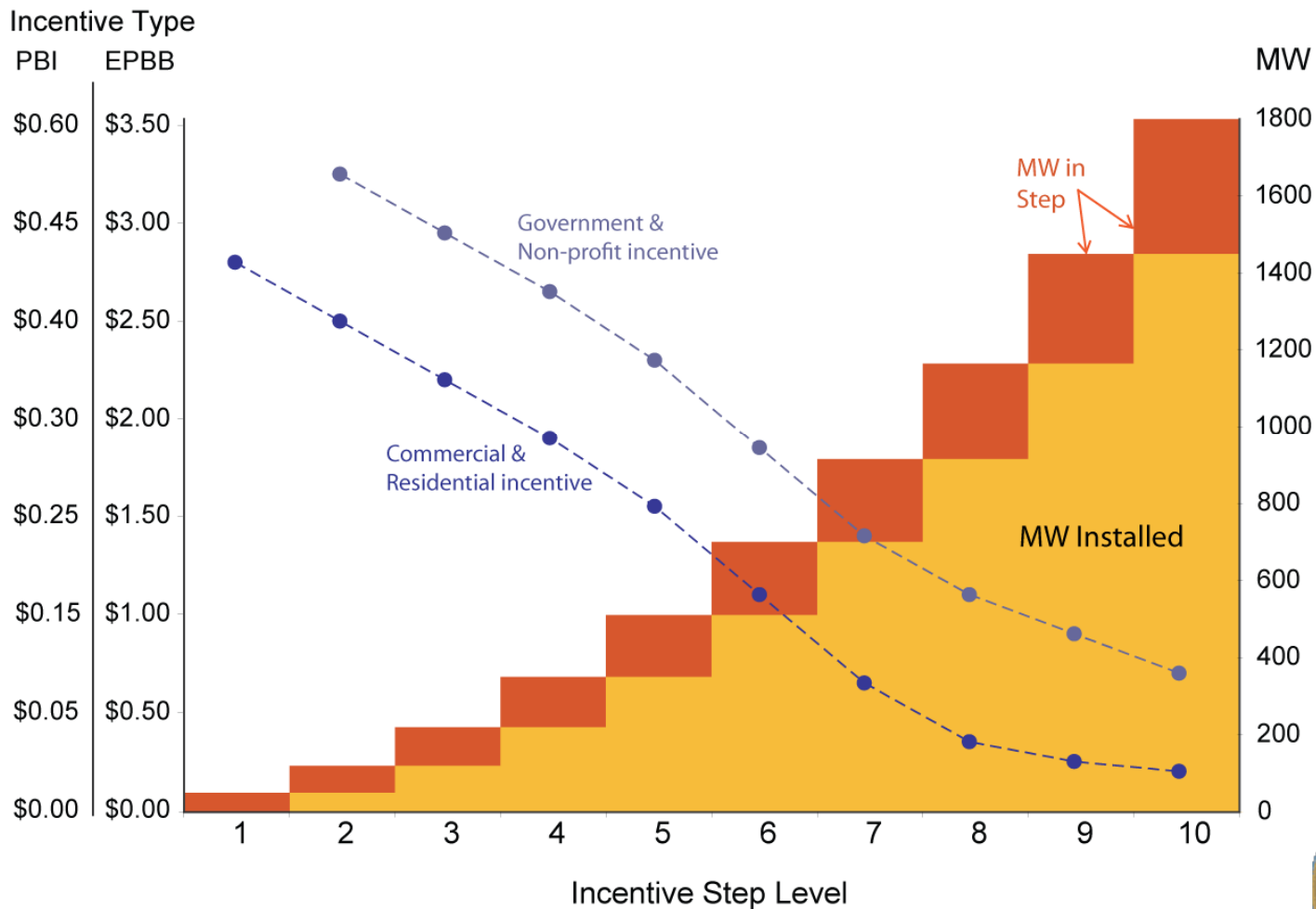
Budget

- \$3.3 billion budget (2007-2016)
- Split between different utility areas

Long-term policy framework

- Uniform incentive eligibility guidelines statewide
- Incentives based on solar performance
- Incentives decline based on program demand

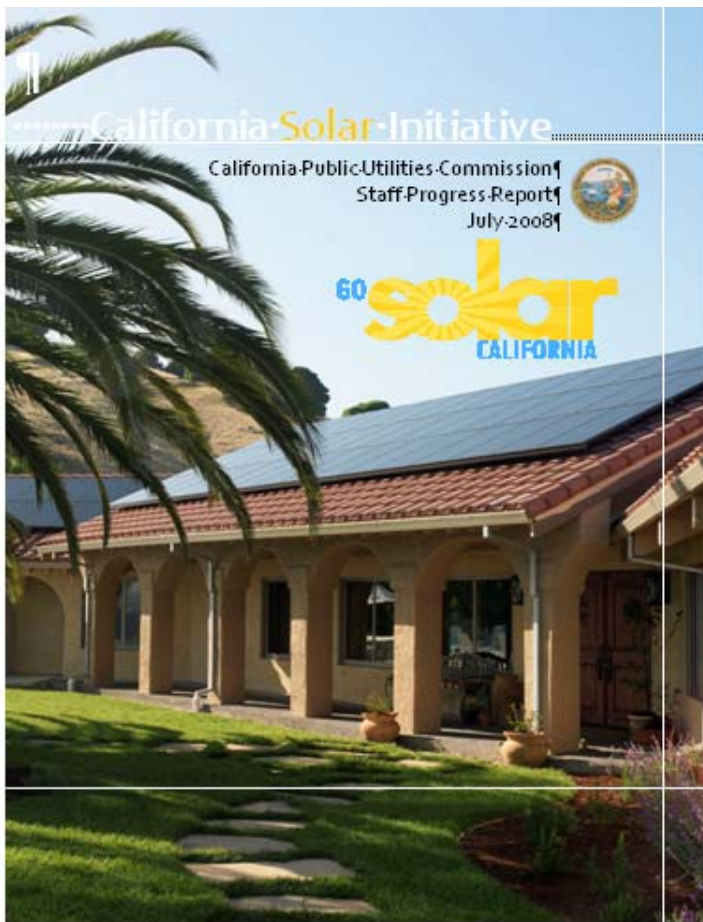
Incentives decline as demand grows: CPUC part of program has a goal of 1,740 MW



PBI: Performance Based Incentive, paid over 5 years, in \$ / kWh
EPBB: Expected Performance Based Buydown, paid upfront, in \$ / W



California Solar Initiative Program Progress



Capacity of CSI Applications

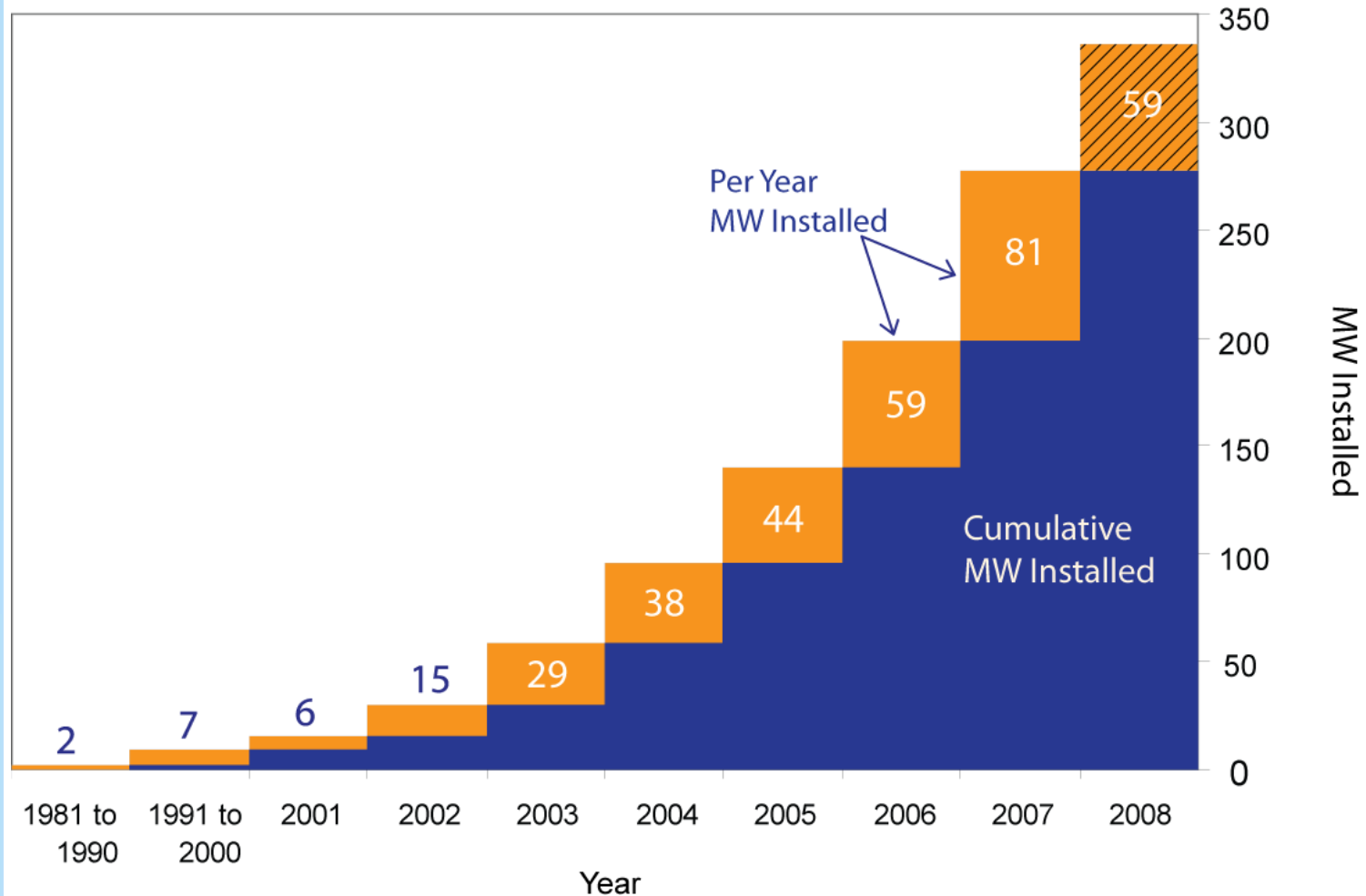
- 49.9 MW Residential
- 201.6 MW Non-Residential
- **251.5 MW Total**
- (76.3 MW Installed)

Number of Applications

- 10,511 Residential
- 1,142 Non-Residential
- **11,653 Total**
- (7,279 Completed)

Staff Progress Report available at:
www.gosolarcalifornia.ca.gov

California installed 339 MW PV at 36,000+ sites thru June 2008

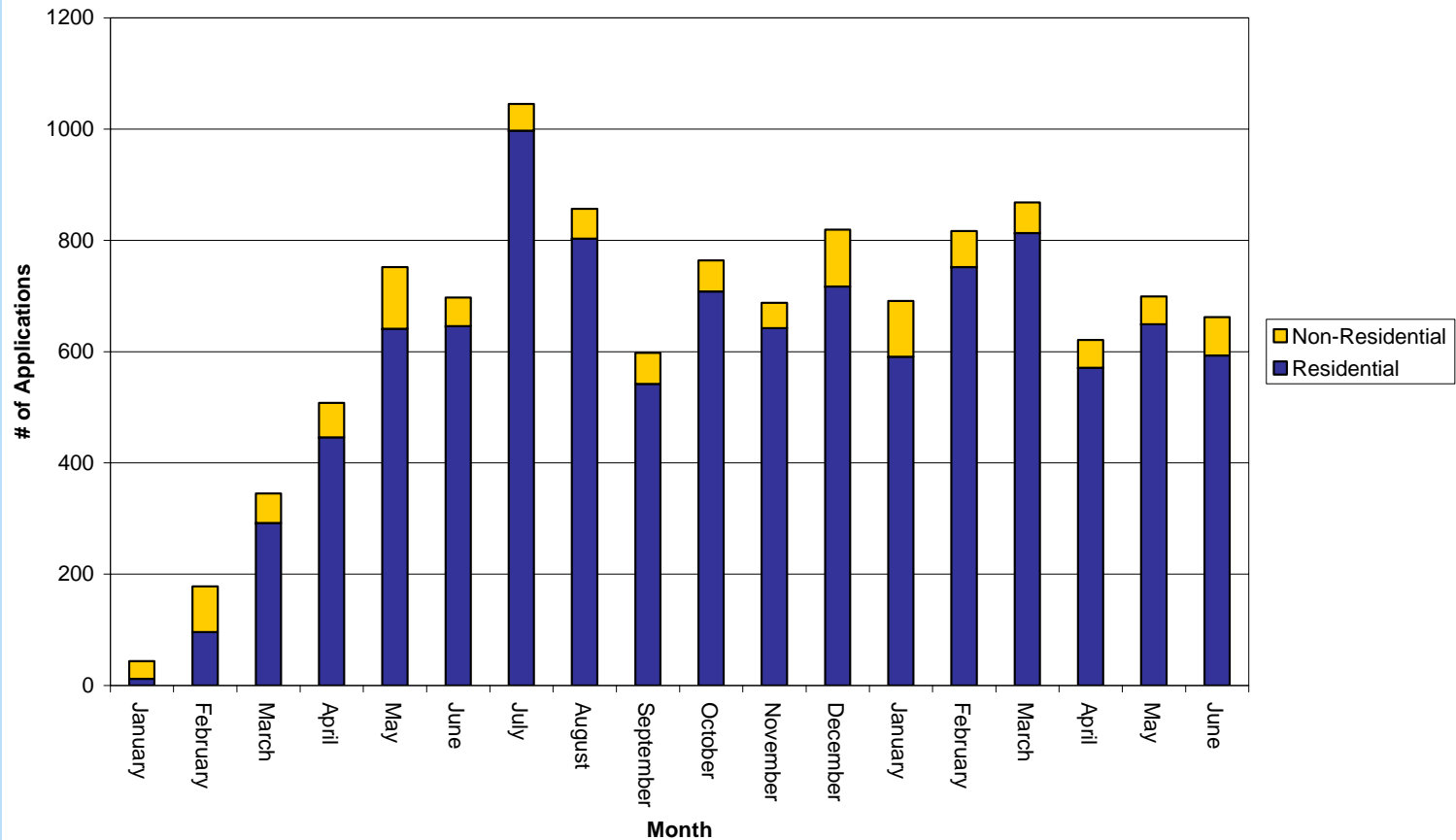


Source: 1981-2007 data from statewide database of California Energy Commission's *Grid Connected PV Capacity Installed in California*, April 1, 2008. 2008 Installed MW are through June 25, 2008 for CSI only.



CSI Applications By Month

Total Applications - All Three Program Administrators
January 1, 2007 - June 25, 2008



Other CSI Program Components

- Research Development, Deployment and Demonstration (RD&D)
 - CPUC Adopted in Sept. 2007
 - Program Manager Selected
- Low-income incentive programs
 - Single Family Program Adopted in Nov. 2007
 - Energy Division working to get a Program Manager selected for Single Family Program
 - Multifamily Low-Income Program Under Development
- Solar Hot Water
 - Pilot Program Launched in July 2007
 - Will inform future implementation of AB 1470 (Huffman, 2007)



Photo: 5.5 kW (DC) system installed by Solar City in Loomis, CA.

CSI Looking Forward



Photo: Brian Peterson, Sierra Nevada Brewing Company, Chico, CA, California Solar Initiative Funded System, 1,258 kW, September 2007, Installer: Chico Electric

- Expect 100 MW+ installed in 2008
 - CA will likely double installed PV capacity within next 2 years
- Watching for a decrease in price of installed solar
- Worldwide demand for PV affects CA market
- Uncertainty is disruptive
 - Federal ITC
 - Credit Markets

Feed-in-Tariff (FiT) Offered to Renewables up to 1.5 MW

- Originally only for water/wastewater customers
- Expanded by the CPUC to include all customers in PG&E and SCE territory
- All eligible RPS technologies, including solar
- Price set by law at “market price referent” (MPR)
 - Reference point of MPR is a new combined cycle gas plant
 - MPR is adjusted for time and season
 - Price appears low for solar PV currently

IOU	Annual Average (\$/kWh)	
	MPR	Solar *
PG&E	\$0.09	\$0.11
SCE	\$0.09	\$0.13
SDG&E	\$0.09	\$0.11

* Solar produces largely on peak so receives a slightly higher average rate



Interconnection and Net Energy Metering (NEM)

- **Interconnection (Rule 21)**
 - CA one of the first states to adopt standard interconnection, operating, and metering requirements for DG
- **Net Energy Metering**
 - CSI customers may offset utility charges with credits from onsite power production.
 - NEM not available to FiT customer-generators
 - NEM customers are exempt from standby charges and interconnection fees.
 - Solar customers receive credit based on the full retail rate for up to 1MW projects.

Utility Owned DG Proposed by SCE

- **In March 2008, SCE requested approval to spend \$875M to install 250 MW of utility owned distributed rooftop solar**
 - Would be SCE owned
 - Would serve its load at the distribution level (\$3.50/Watt)
 - Would use leased roof space
 - Would contribute to RPS as utility procurement
 - Would be included in ratebase
 - Would be first of its kind utility scale investment
- **Requires CPUC approval**
 - If approved, SCE would go out to bid to see if any suppliers could meet the price

Additional Information

For further information on:

- **Renewable Portfolio Standard**
<http://www.cpuc.ca.gov/PUC/energy/electric/renewableenergy/index.htm>
- **California Solar Initiative**
<http://www.gosolarcalifornia.ca.gov/>
<http://www.cpuc.ca.gov/PUC/energy/solar/>

or Stop by Booth 9505!
- **Feed In Tariff for Small Renewables**
<http://www.cpuc.ca.gov/PUC/energy/electric/RenewableEnergy/feedintariffs.htm>